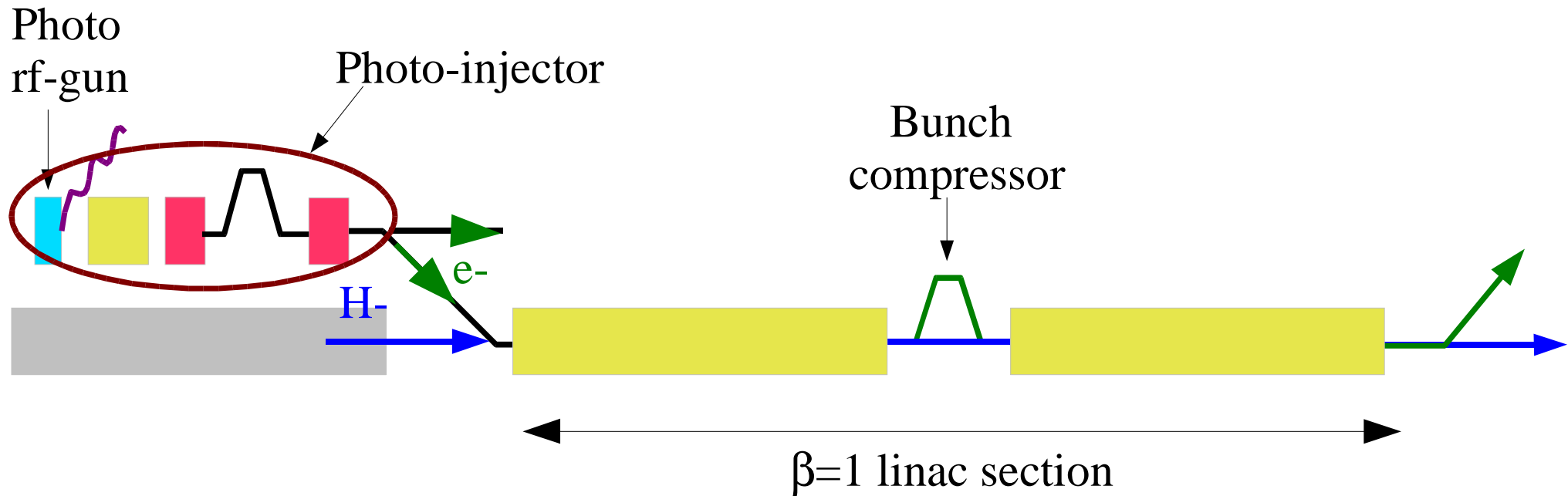
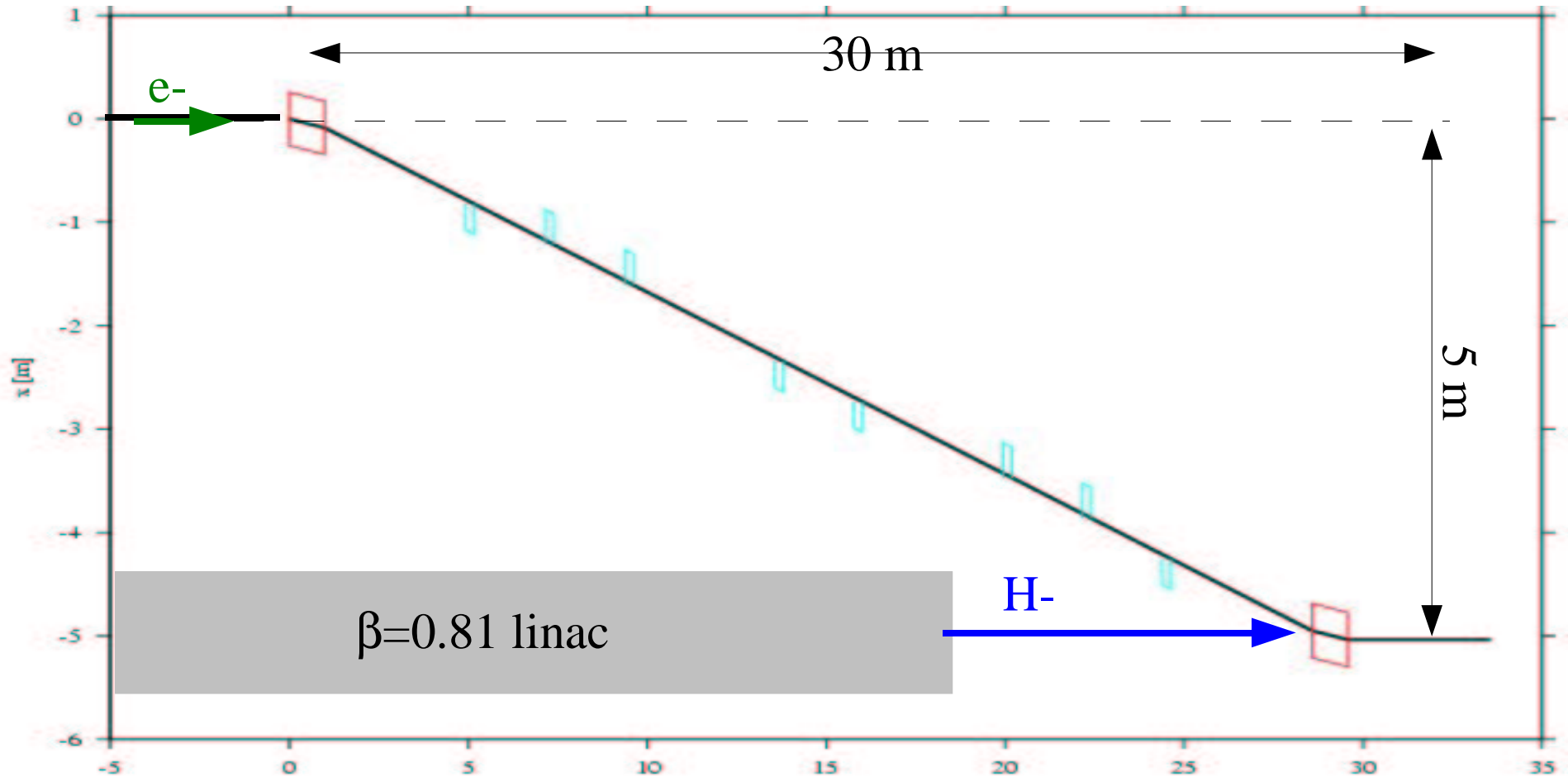


Electrons in $\beta=1$ linac section



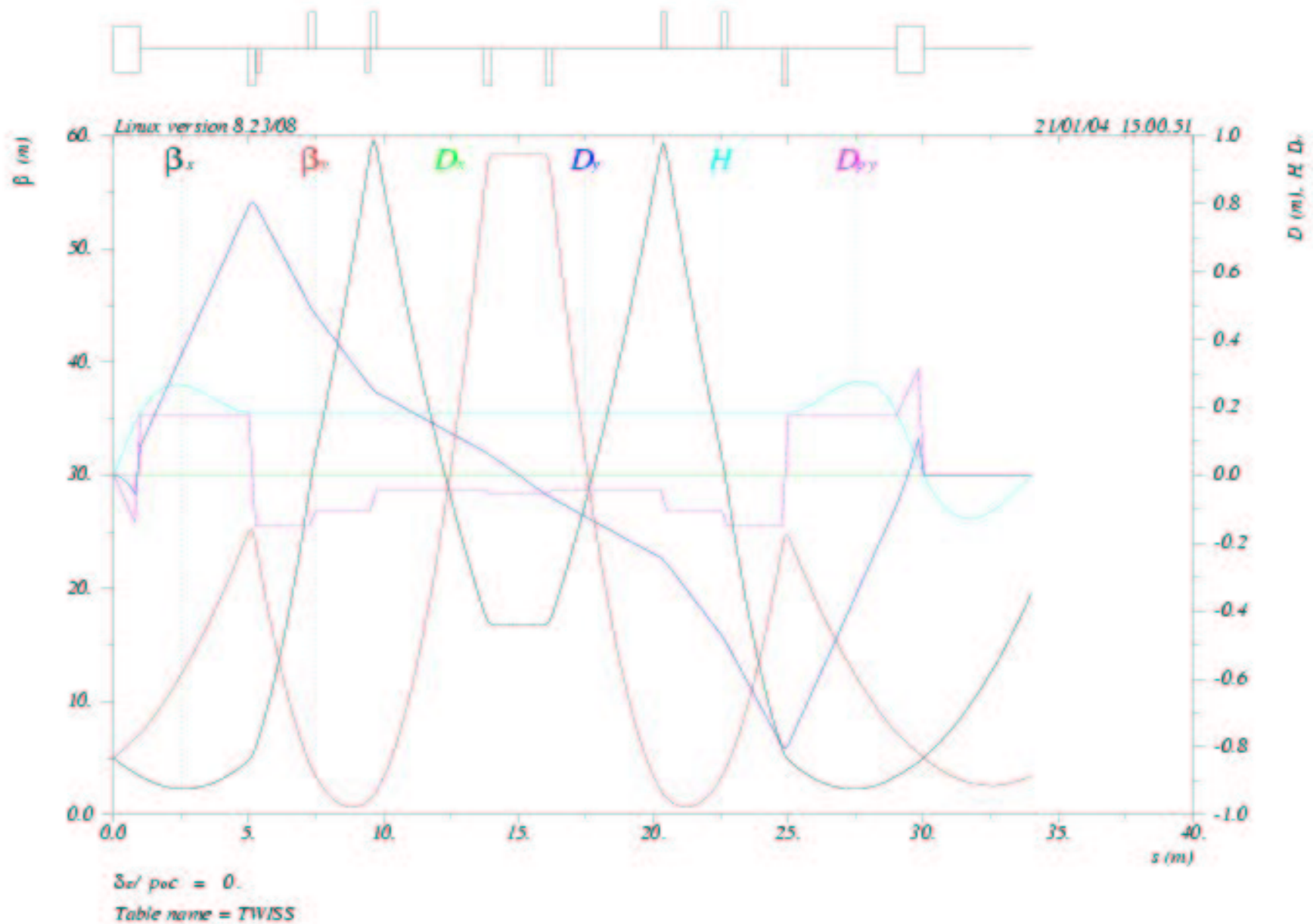
- **Photo-injector** to produce high charge, low emittance and reasonable bunch length,
- **Injection dogleg** + matching telescope for injection in the main linac
- **Magnetic chicane** in main linac to increase electron peak current
- **Extraction + transfer line** to users (not worked out yet)

A possible injection dogleg for the main linac

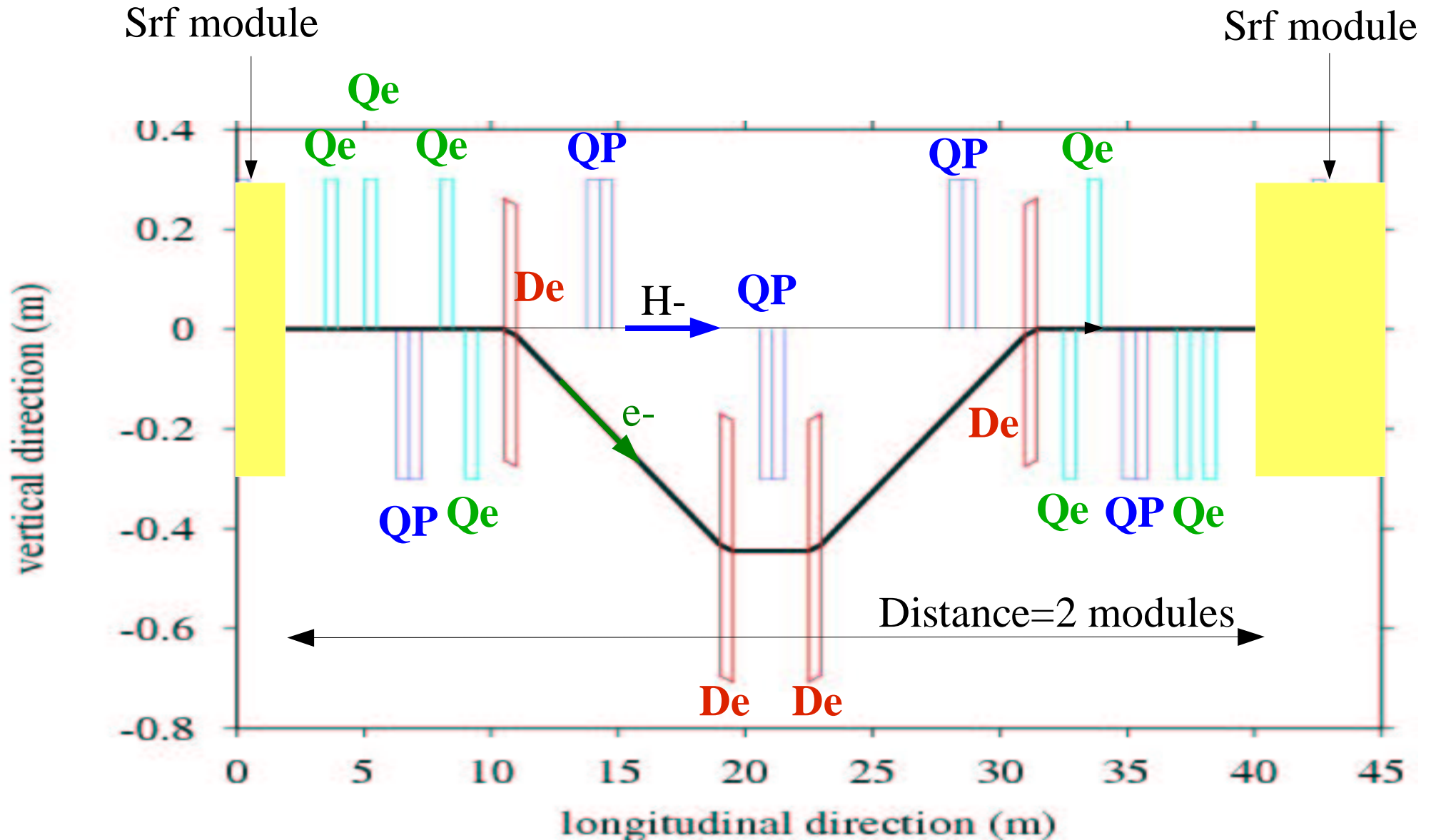


Bending angle ~ 9.5 deg chosen to reduce as much as possible impact from coherent synchrotron radiation (energy spread dilution)
Potential big chromatic-induced emittance growth if too large incoming energy spread

A possible injection dogleg for the main linac linear optics

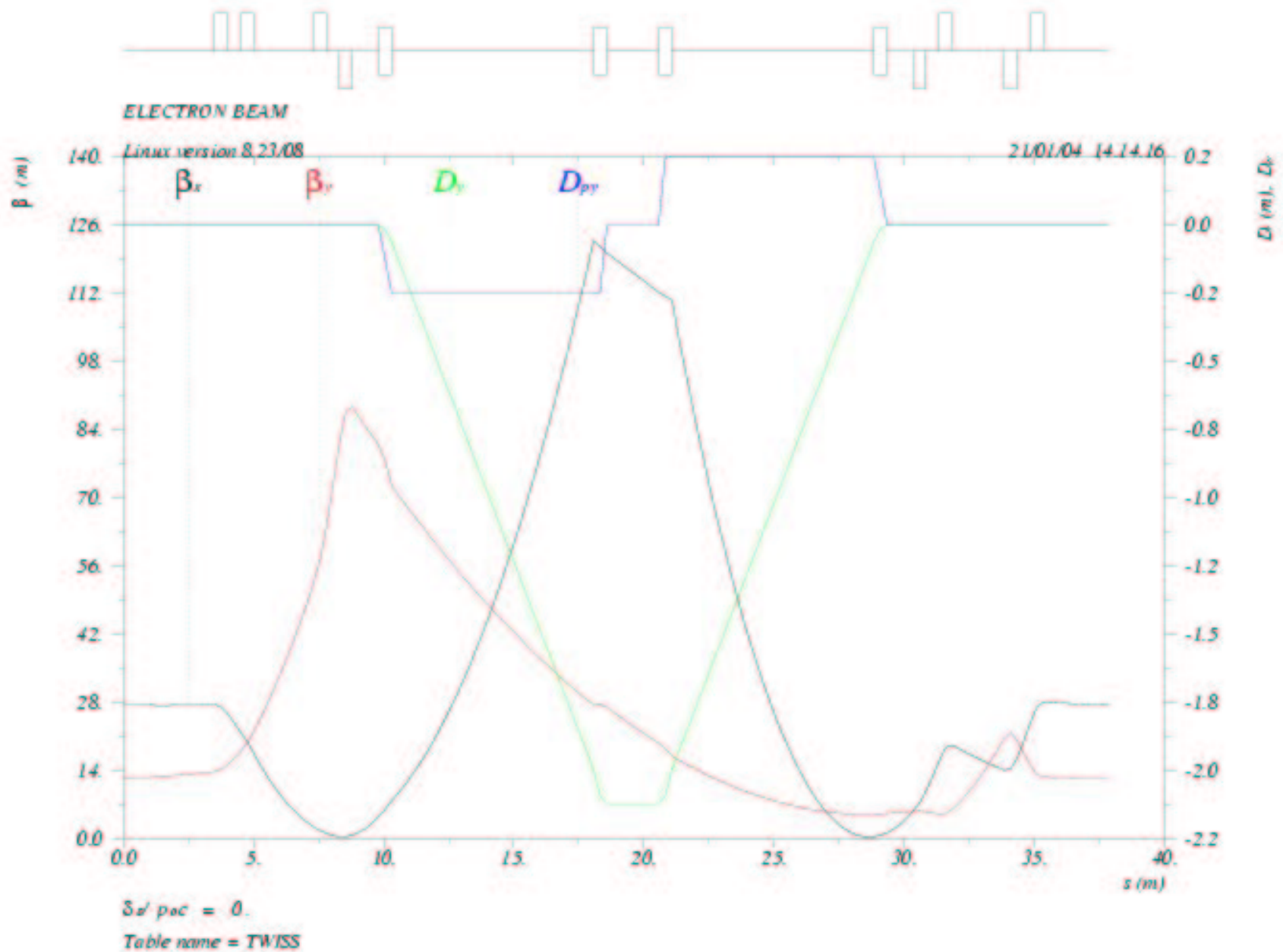


A possible chicane insertion for the main linac



QP: Quads for p; Qe and De Quads + Dipoles for e- (pulsed?)

A possible chicane insertion for the main linac (linear optics)

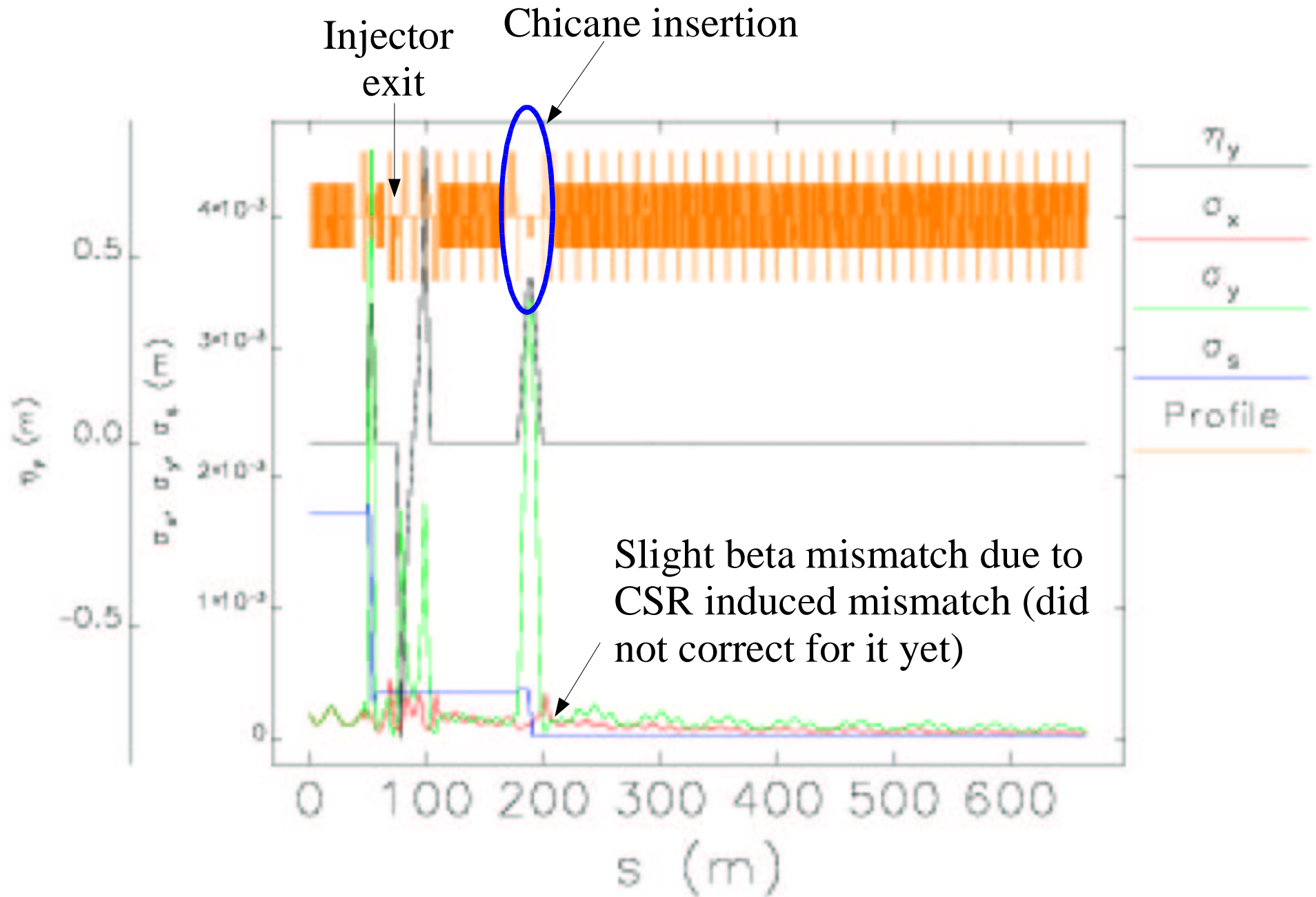


Start-to-end simulation

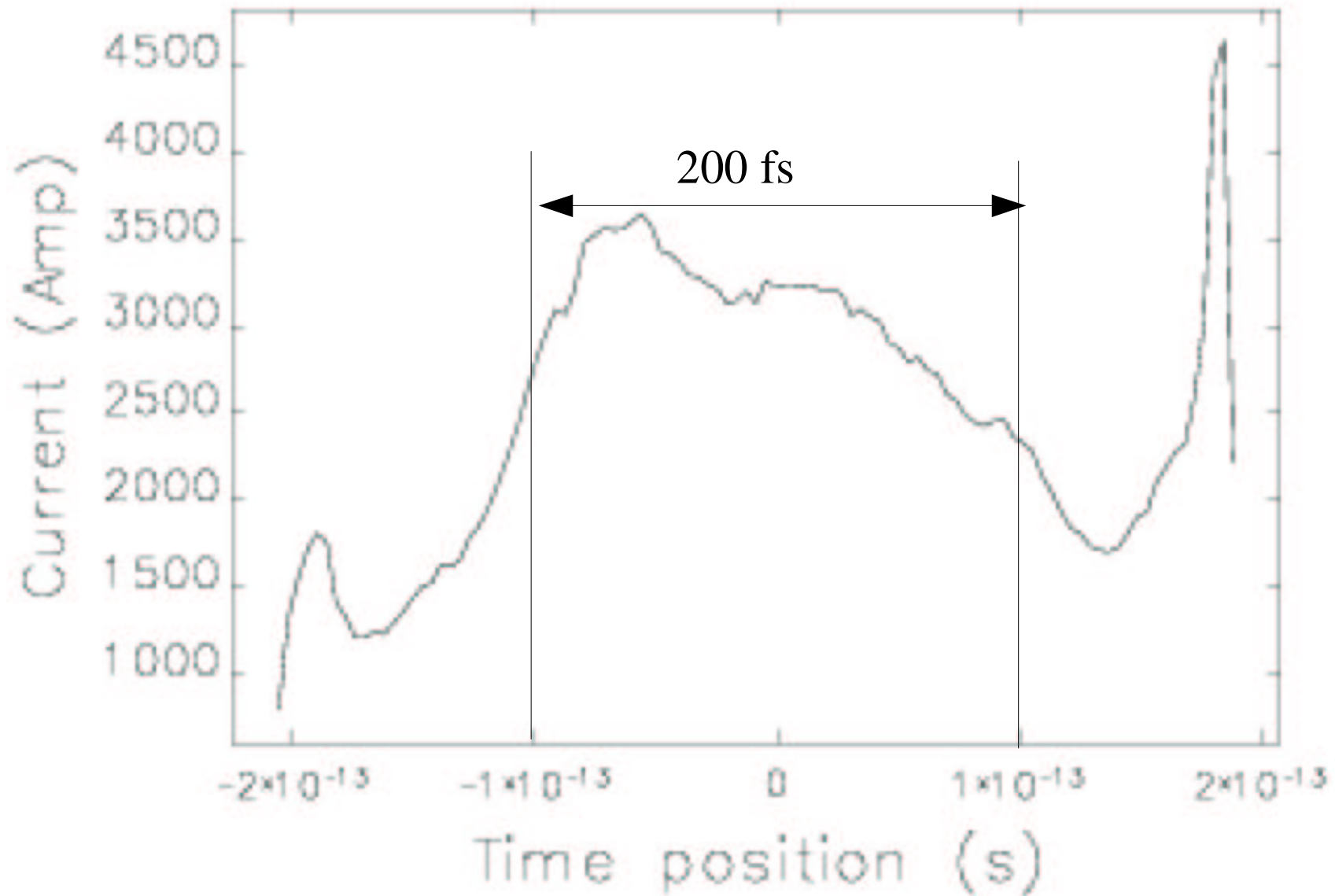
(preliminary tracking not fully optimized)

- Low energy part tracked with ASTRA (DESY) space charge code (injector part)
- Dogleg optics + insertion chicane designed with MAD, and some higher order optics still under study with COSY-infinity
- Tracking from injector part to end of beamline done with ELEGANT (ANL) that included a simple model for the CSR effects

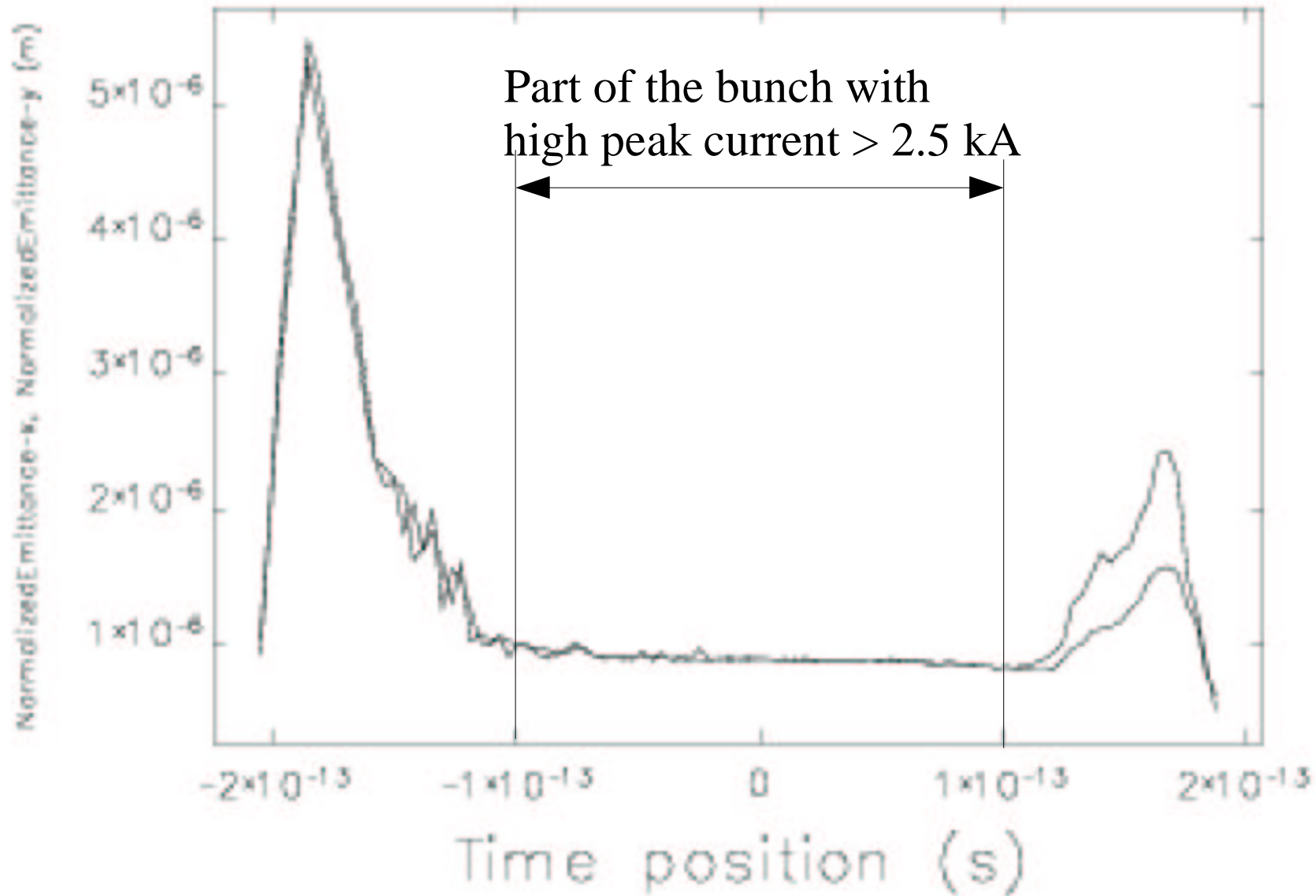
Start-to-end simulation (preliminary tracking not fully optimized)



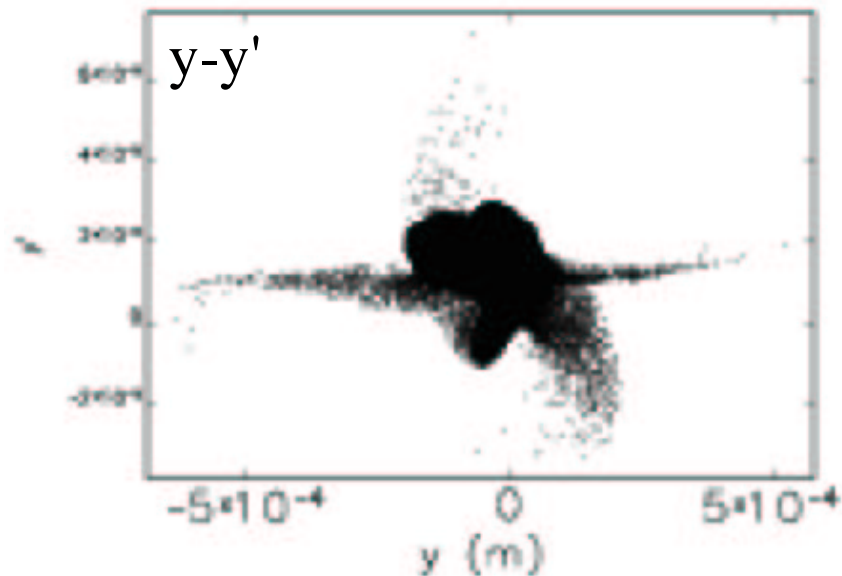
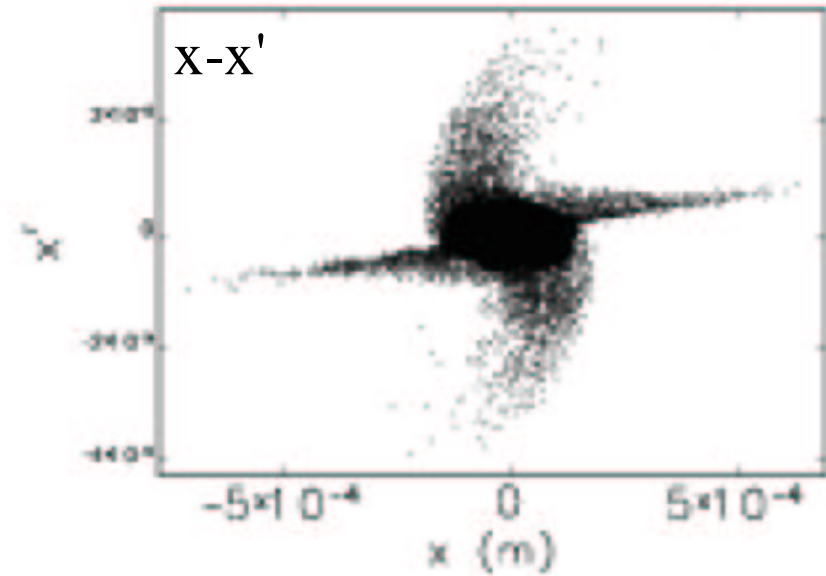
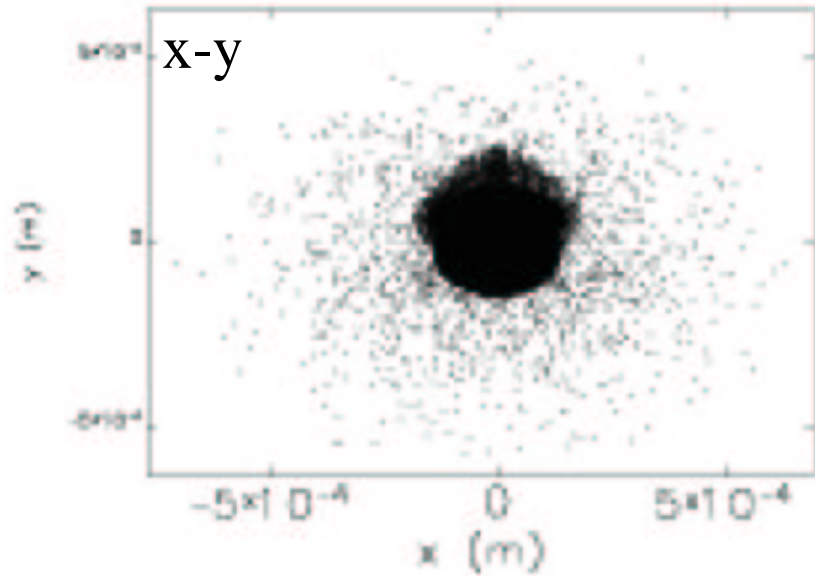
Current along the bunch at linac front end (preliminary tracking not fully optimized)



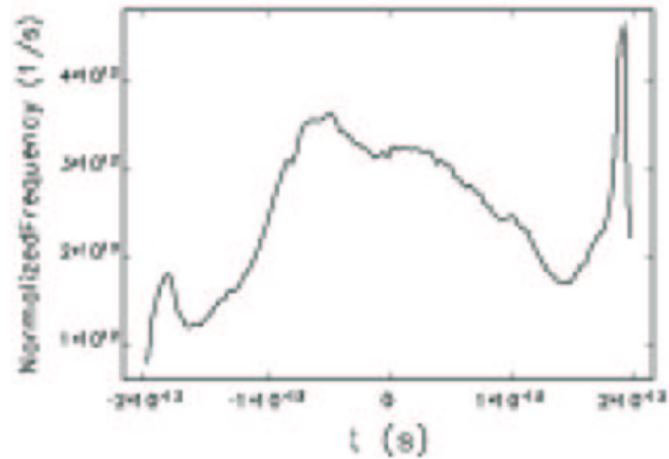
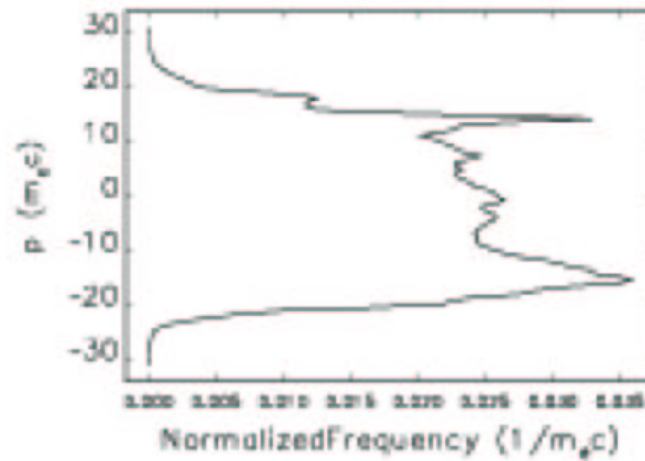
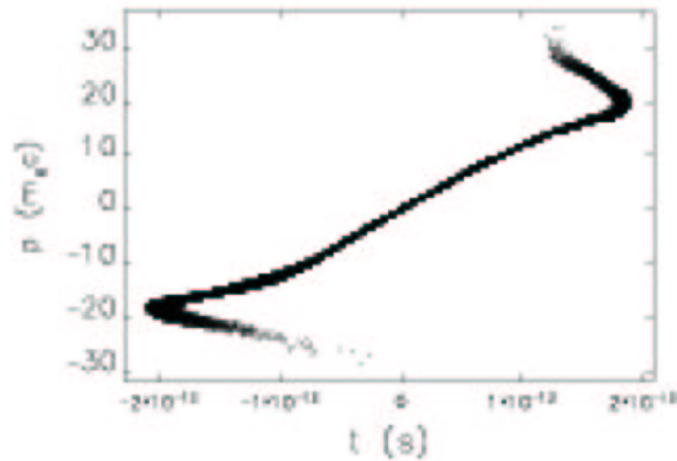
Slice emittance along the bunch at linac frontend (preliminary tracking not fully optimized)



Linac end: electron transverse phase spaces (preliminary tracking not fully optimized)



Linac end: electron longitudinal phase space (preliminary tracking not fully optimized)



What next?

- Look for THE optimum location for the chicane insertion,
- Includes longitudinal + transverse wakefields
- Optimize injector + try to add sextupole in the injection dogleg
- Design extraction dogleg.